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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/507,095

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Gerhard Tuymer

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EXAMINER

BAND, MICHAEL A

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

07/02/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/507,095	Applicant(s) TUYMER ET AL.	
	Examiner MICHAEL BAND	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/1/2009; 4/1/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goedicke et al (US Patent No. 6,340,416) in view of Manley (US Patent No. 5,993,613).

With respect to claims 1-3 and 13-14, Goedicke et al discloses a system for operating magnetron discharges used in vacuum coating by generating a plasma (col. 1, lines 14-22), where fig. 2 depicts a vacuum chamber [1] comprising a substrate [3] and two electrodes [2.1], [2.2] that are spaced from each other with two outputs [X₁], [X₂] directly connected to said electrodes [2.1], [2.2]. Fig. 2 further depicts an AC generator [11] connected via a mains connection to a rectifier [10] with said rectifier [10] connected to a full bridge circuit [9] comprising four switches [S₁]-[S₄] with said full bridge (i.e. converter) circuit [9] having a control unit [7] and connected to the two outputs [X₁], [X₂]. The rectifier [10] converts the alternating current (AC) into a bipolar pulsing direct current (DC) having a sinusoidal frequency of 40 kHz and a pulse frequency of 80 kHz (col. 9, lines 7-30; figs. 2-3). Goedicke et al also discloses the electrode [2.1] being a cathode and the electrode [2.2] being the anode, with said electrode [2.1] switching to an anode and said electrode [2.2] switching to a cathode by

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reversal of the current direction via a potential-free generator (col. 9, lines 14-27).

However while it is known that a full bridge circuit has a transformer, it is not specified whether the transformer has a primary winding and a secondary winding.

Manley discloses a film deposition apparatus [10] depositing a film [12] of material onto a substrate [16] by sputtering from a target/cathode assembly [20] by generating a plasma [38] with a vacuum pump [28] attached a process chamber [18] (abstract; fig. 1), with fig. 1 depicting the cathode [20] and anode [18] (i.e. two electrodes) spaced apart with the plasma [38] between said cathode [20] and anode [18] (col. 4, lines 1-6). Fig. 1 further depicts an AC source [82] powering a plasma discharge, with said AC source [82] connected to a rectifier [80], with fig. 6 depicting said rectifier [80] connected to a converter (i.e. bridge) circuit [94]. Fig. 6 depicts the bridge circuit having four switches [95]-[98], controlled via a current control [13]. Manley discusses the pulses given to the cathode and anode as being at a frequency in the range of about 20 kHz to about 80 kHz (col. 12, lines 3-7). Figs. 6 and 8 also depict the bridge circuit [94] having a transformer [100], with said transformer [100] having a primary winding [49] and a secondary winding [101], where said secondary winding [101] has two output connections connected to the cathode [20] and the anode [18]. Manley further discloses an output voltage of the rectifier [80], and therefore the input of the converter circuit [94], as in the range of 100 volts to 1000 volts and a power in the range of 1 kw to 15 kw (col. 13, lines 34-39). Modified Manley also specifies that the bridge circuit [81], [83], [95]-[98] are rated at 500 volts and 71 amps (col. 13, lines 56-60). Modified Manley also discusses an inductance value of 0.3 mH (col. 13, lines 29-

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42). Despite Manley not providing a specific output voltage and current for the converter circuit [94], it is either inherent or obvious to use a voltage and/or current with a voltage transformation ratio no greater 1:2, as evidenced by Melnychuk et al (US Patent No. 6,815,700; abstract; col. 22, lines 50-57).

It would have been obvious to one of ordinary skill in the art to connect the two outputs from the secondary winding to the electrodes as taught by Manley for the connection between the full bridge and deposition electrodes of Goedicke et al since Goedicke et al fails to specify what part of the bridge connection the outputs are connected too and one of ordinary skill would have a reasonable expectation for success in making the modification since Manley has shown success in connecting the secondary winding to the electrodes via two outputs.

With respect to claims 4-7, modified Goedicke et al further discloses the bridge circuit [9] is clocked for setting an output voltage of bipolar pulses (fig. 3b), where fig. 2 depicts said bridge circuit [9] having the control unit [7] which controls the four switches [S₁]-[S₄] which in turn controls the setting and regulation of pulse behavior, the duty factor, the pulse width, and setting the pulse curve form for said bridge circuit [9] (col. 9, lines 5-33). Figs. 3a-b also depict a pulse interspace between successive pulses.

With respect to claim 8, Manley further teaches in fig. 6 further depicts a circuit node [81] of the bridge circuit [81], [83], [95]-[98] which is capable of short circuiting the primary winding [49] via switching [95] and switching [96].

With respect to claim 9-12, Manley further teaches in fig. 6 a diode bridge [102]-[105] succeeding the converter circuit [94], with said converter circuit [94] being a phase

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shift converter (col. 12, lines 48-51). Since Manley depicts in fig. 6 multiple bridge circuits [81], [83], [95]-[98] and [102]-[105], it is obvious that one of ordinary skill in the art to use four bridges with each bridge having a similar design to either the first bridge circuit [81], [83], [95]-[98] and/or the second bridge [102]-[105].

With respect to claims 15-20, modified Goedicke et al further discloses sputter deposition using reactive sputtering for depositing Al_2O_3 by an aluminum targets and a reactive argon-oxygen gas mixture (i.e. dielectric materials) (col. 1, lines 14-22; col. 8, lines 63-67; col. 9, lines 33-36), with it being either inherent or obvious for the deposited aluminum oxide to have alpha- and gamma-phases.

Response to Arguments

103 Rejections

3. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection due to the new claim limitations requiring the two outputs which are respectively and directly connected to the two electrodes from the claim amendments filed 4/1/2009.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 9am-5pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./

Examiner, Art Unit 1795

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1795